Appendix I: Storage Facility Costs & Curves

National ENR CCI (Aug-05) =	7518
Seattle ENR CCI (Aug-05) =	8390
Average Michigan Location Factor =	96
San Francisco California Location Factor =	122
Seattle, Wa Location Factor =	105

Location	Project Name	Volume (Mgal)	Year	Average Location Factor (RS Means)	National ENR CCI	Original	Adjusted (2005)	Adjusted (to Seattle using RS Means City Cost Index)	Unit Cost ($/gal)
Michigan	Redford Township Retention Basin	1.9	1997	96	5860	$15,700,000	$20,142,082	$22,030,402	$11.59
Michigan	Seven Mile Retention Basin	2.2	1998	96	5880	$14,500,000	$18,539,286	$20,277,344	$9.22
Michigan	Dearborn Heights Retention Basin	2.7	1997	96	5860	$19,100,000	$21,200,000	$23,187,500	$8.59
Michigan	Puritan-Fenkell Retention Basin	2.8	1999	96	6039	$17,200,000	$21,412,419	$23,419,834	$8.36
Michigan	Inkster Retention Basin	3.1	1997	96	5860	$20,400,000	$26,171,877	$28,625,491	$9.23
Michigan	Norfolk CSO Storage/Treatment Tank	4.2	1998	96	5880	$17,400,000	$22,247,143	$24,332,813	$5.79
Michigan	Acacia Park Retention Basin	4.5	1997	96	5860	$13,900,000	$17,832,799	$19,504,624	$4.33
Michigan	Bloomfield Village	10.2	1997	96	5860	$28,900,000	$37,076,826	$40,552,778	$3.98
Michigan	Hubble-Southfield Retention Basin	22.0	1999	96	6039	$51,900,000	$64,610,730	$70,667,986	$3.21
Michigan	Market Avenue Retention Basin	30.4	1990	96	4732	$30,000,000	$47,662,722	$52,131,102	$1.71
Michigan	Grand Rapids	30.5	Jun-92	96	4973	$30,000,000	$45,352,906	$49,604,741	$1.63
San Francisco	Mariposa	0.7	1992	122	4973	$10,170,000	$15,374,635	$13,232,268	$18.90
San Francisco	Sunnydale	6.2	1991	122	4818	$19,300,000	$30,115,691	$25,919,242	$4.18

Local Project Name		Volume (Mgal)	Year		Seattle ENR CCI	Original	Adjusted (2005)		Unit Cost ($/gal)
Seattle	North Creek Storage	6.0	Dec-99		7137	$18,700,000	$21,983,046		$3.66

Comparision of Current Stroage Formulas with Escalation and the Output of the Escalated Formulas

Current Dewatering Formula (Dec 1999 Dollars)

Standard ($) = $750 x (Storage (Mgal))^2 + $36,500 x (Storage (Mgal)) + $340,000

Complex ($) = $1,000 x (Storage (Mgal))^2 + $68,500 x (Storage (Mgal)) + $650,000

Escalated Dewatering Formula (Aug 2005 Dollars)

Standard ($) = $880 x (Storage (Mgal))^2 + $43,000 x (Storage (Mgal)) + $400,000

Complex ($) = $1,175 x (Storage (Mgal))^2 + $80,500 x (Storage (Mgal)) + $765,000

Standard Dewatering

Storage (Mgal)	Cost w/ Current Formula	Escalation Factor	Escalated Current Value	Cost w/ Escalated Formula	% Difference
1	$377,250	1.176	$443,482	$443,880	0.1%
2	$416,000	1.176	$489,035	$489,520	0.1%
3	$456,250	1.176	$536,351	$536,920	0.1%
4	$498,000	1.176	$585,431	$586,080	0.1%
5	$541,250	1.176	$636,274	$637,000	0.1%
10	$780,000	1.176	$916,940	$918,000	0.1%
15	$1,056,250	1.176	$1,241,689	$1,243,000	0.1%
20	$1,370,000	1.176	$1,610,523	$1,612,000	0.1%
25	$1,721,250	1.176	$2,023,439	$2,025,000	0.1%
30	$2,110,000	1.176	$2,480,440	$2,482,000	0.1%

Complex Dewatering

Storage (Mgal)	Cost w/ Current Formula	Escalation Factor	Escalated Current Value	Cost w/ Escalated Formula	% Difference
1	$719,500	1.176	$845,818	$846,675	0.1%
2	$791,000	1.176	$929,871	$930,700	0.1%
3	$864,500	1.176	$1,016,275	$1,017,075	0.1%
4	$940,000	1.176	$1,105,030	$1,105,800	0.1%
5	$1,017,500	1.176	$1,196,136	$1,196,875	0.1%
10	$1,435,000	1.176	$1,686,934	$1,687,500	0.0%
15	$1,902,500	1.176	$2,236,510	$2,236,875	0.0%
20	$2,420,000	1.176	$2,844,865	$2,845,000	0.0%
25	$2,987,500	1.176	$3,511,997	$3,511,875	0.0%
30	$3,605,000	1.176	$4,237,908	$4,237,500	0.0%

Comparision of Current Stroage Formulas with Escalation and the Output of the Escalated Formulas

Current Odor Control Formula (Dec 1999 Dollars)
Odor Control ($) = $126,000 x (Storage (Mgal) +$10,000

Escalated Odor Control Formula (Aug 2005 Dollars)
Odor Control ($) = $148,000 x (Storage (Mgal) +$12,000

Odor Control

Storage (Mgal)	Cost w/ Current Formula	Escalation Factor	Escalated Current Value	Cost w/ Escalated Formula	% Difference
1	$136,000	1.176	$159,877	$160,000	0.1%
2	$262,000	1.176	$307,998	$308,000	0.0%
3	$388,000	1.176	$456,119	$456,000	0.0%
4	$514,000	1.176	$604,240	$604,000	0.0%
5	$640,000	1.176	$752,361	$752,000	-0.1%
10	$1,270,000	1.176	$1,492,966	$1,492,000	-0.1%
15	$1,900,000	1.176	$2,233,572	$2,232,000	-0.1%
20	$2,530,000	1.176	$2,974,177	$2,972,000	-0.1%
25	$3,160,000	1.176	$3,714,782	$3,712,000	-0.1%
30	$3,790,000	1.176	$4,455,387	$4,452,000	-0.1%

Comparision of Current Stroage Formulas with Escalation and the Output of the Escalated Formulas

Current Effluent Pump Station Formula (Dec 1999 Dollars)

Effluent Pump Station ($) = $1.15 x (22,000 x Capacity (Mgal)$^{0.85}$ +120,000)

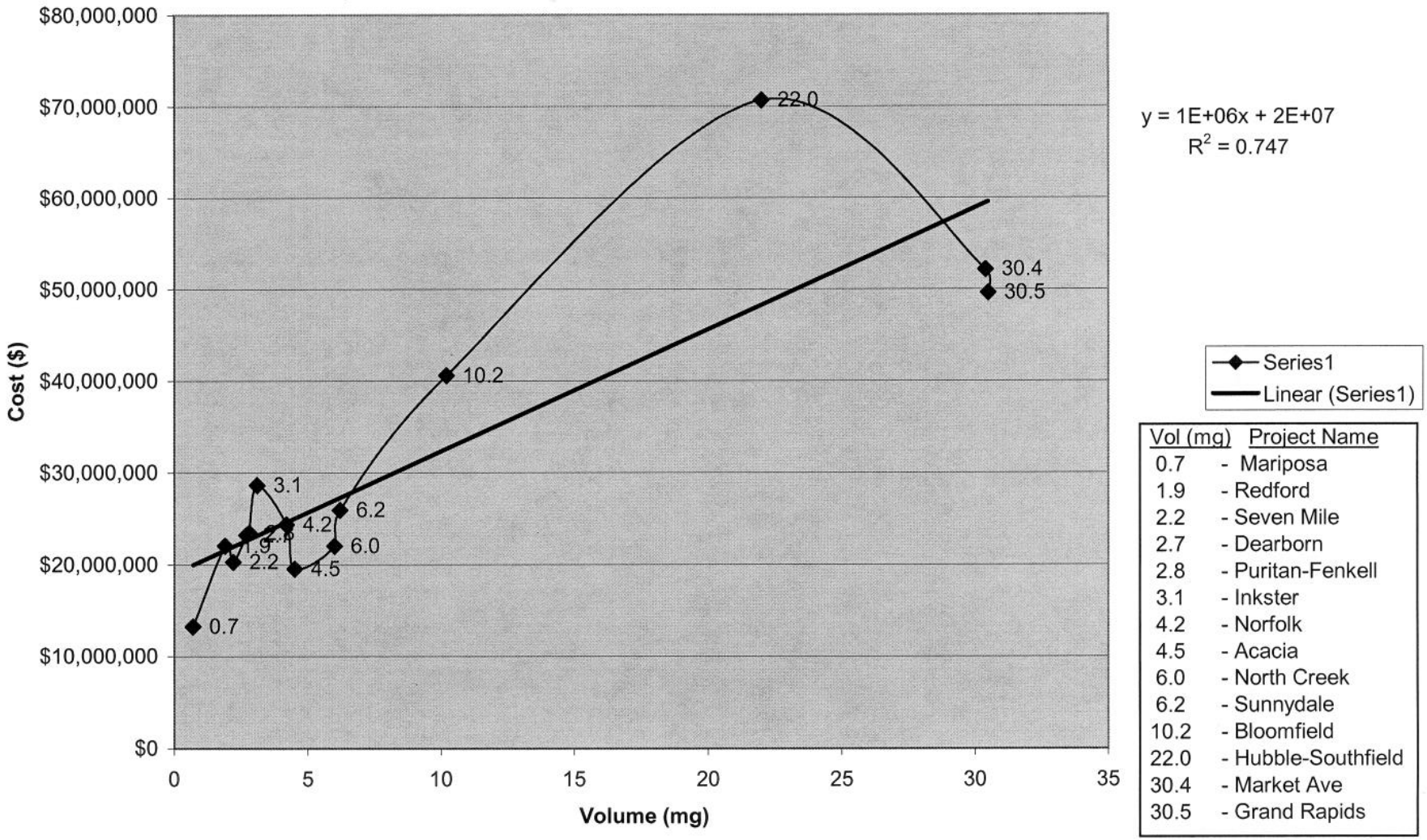
Escalated Effluent Pump Station Formula (Aug 2005 Dollars)

Effluent Pump Station ($) = $1.35 x (22,000 x Capacity (Mgal)$^{0.85}$ +120,000)

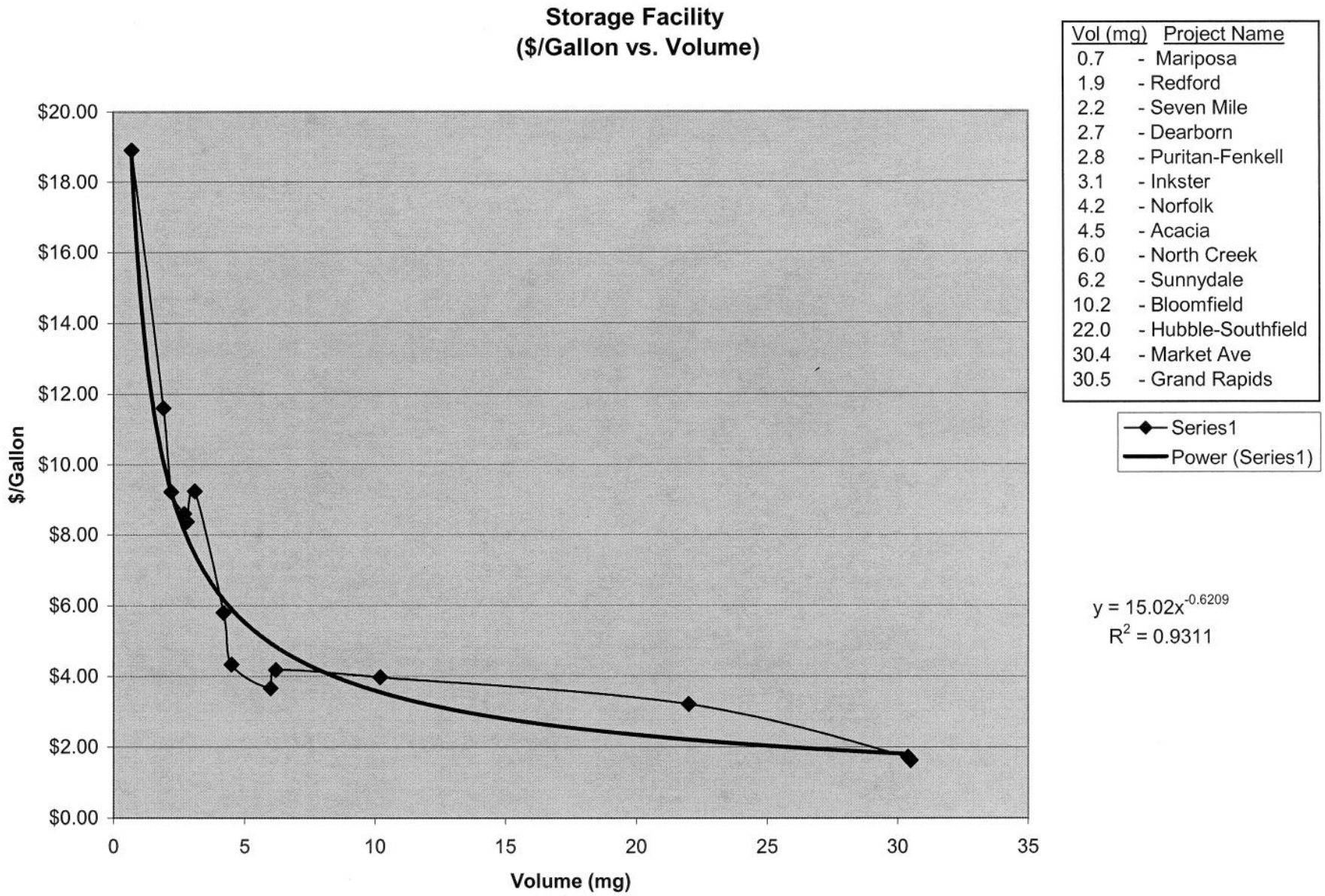
Effluent Pump Station

Storage (Mgal)	Cost w/ Current Formula	Escalation Factor	Escalated Current Value	Cost w/ Escalated Formula	% Difference
1	$163,300	1.176	$191,970	$191,700	-0.2%
2	$183,603	1.176	$215,837	$215,534	-0.2%
3	$202,369	1.176	$237,897	$237,563	-0.2%
4	$220,200	1.176	$258,859	$258,496	-0.2%
5	$237,368	1.176	$279,041	$278,649	-0.2%
10	$317,110	1.176	$372,783	$372,260	-0.2%
15	$390,812	1.176	$459,425	$458,780	-0.2%
20	$460,846	1.176	$541,754	$540,994	-0.2%
25	$528,274	1.176	$621,020	$620,148	-0.2%
30	$593,694	1.176	$697,926	$696,945	-0.2%

Storage Facility
(Total Cost vs. Volume)



Vol (mg)	Project Name
0.7	- Mariposa
1.9	- Redford
2.2	- Seven Mile
2.7	- Dearborn
2.8	- Puritan-Fenkell
3.1	- Inkster
4.2	- Norfolk
4.5	- Acacia
6.0	- North Creek
6.2	- Sunnydale
10.2	- Bloomfield
22.0	- Hubble-Southfield
30.4	- Market Ave
30.5	- Grand Rapids


Storage Facility
($/Gallon vs. Volume)
$/Gallon
$20.00
$18.00
$16.00
$14.00
$12.00
$10.00
$8.00
$6.00
$4.00
$2.00
$0.00
0
5
10
15
20
25
30
35
Volume (mg)
Vol (mg) Project Name
0.7 - Mariposa
1.9 - Redford
2.2 - Seven Mile
2.7 - Dearborn
2.8 - Puritan-Fenkell
3.1 - Inkster
4.2 - Norfolk
4.5 - Acacia
6.0 - North Creek
6.2 - Sunnydale
10.2 - Bloomfield
22.0 - Hubble-Southfield
30.4 - Market Ave
30.5 - Grand Rapids
Series1
Power (Series1)
y = 15.02x^-0.6209
R^2 = 0.9311